NDIA
6th Annual
Systems Engineering Conference

Presented by
Mr. Don Johnson, NSWC, Pt. Hueneme Division (ISEA)
Mr. Bill Ratner, ITT Gilfillan (OEM)

San Diego, California
28 October 2003

Gilfillan
ITT Industries

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Purpose of Presentation

- Show innovative tactics and lessons learned in bringing current technologies to a “legacy system” for improving its life cycle while enhancing performance.
- Focuses on the effort to improve the Life Cycle of the AN/SPS-48E Radar by NAVSEA, NSWC & OEM

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Major Theme and Subsets

- AN/SPS-48E Mid Life Upgrade addresses emerging threats to both Life Cycle and Mission Capabilities.
- Introduce solid-state amplifier technology to replace the high power to Reduce impact of high failure components in the transmitter
- Introduce open architecture processing to address the issue of unprocurable parts while ensuring that future technology upgrades are made more affordable
- Address the immediate problem of diminishing manufacturing sources
- Provide enhanced radar performance and remote diagnostic capability for reduced manning.
- Reduce Ownership cost.
- Follow the radar roadmap

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Tactics & Lessons Learned

Approach

- **Tactics Applied**
  - Open Discussion of Needs
  - Benchmark to Roadmap
  - Engage customers and end users
  - Inventory Technology
  - Focus on Value
  - Establish Metrics to Measure Value
  - Conduct Risk Assessment
- **Lesson Learned**
  - Know what you want
  - Know what you have
  - Know your data
  - Know how you are going to get what you what
  - Follow the process
  - Conduct Risk Assessment through a 3rd Party
  - Inform Stakeholders

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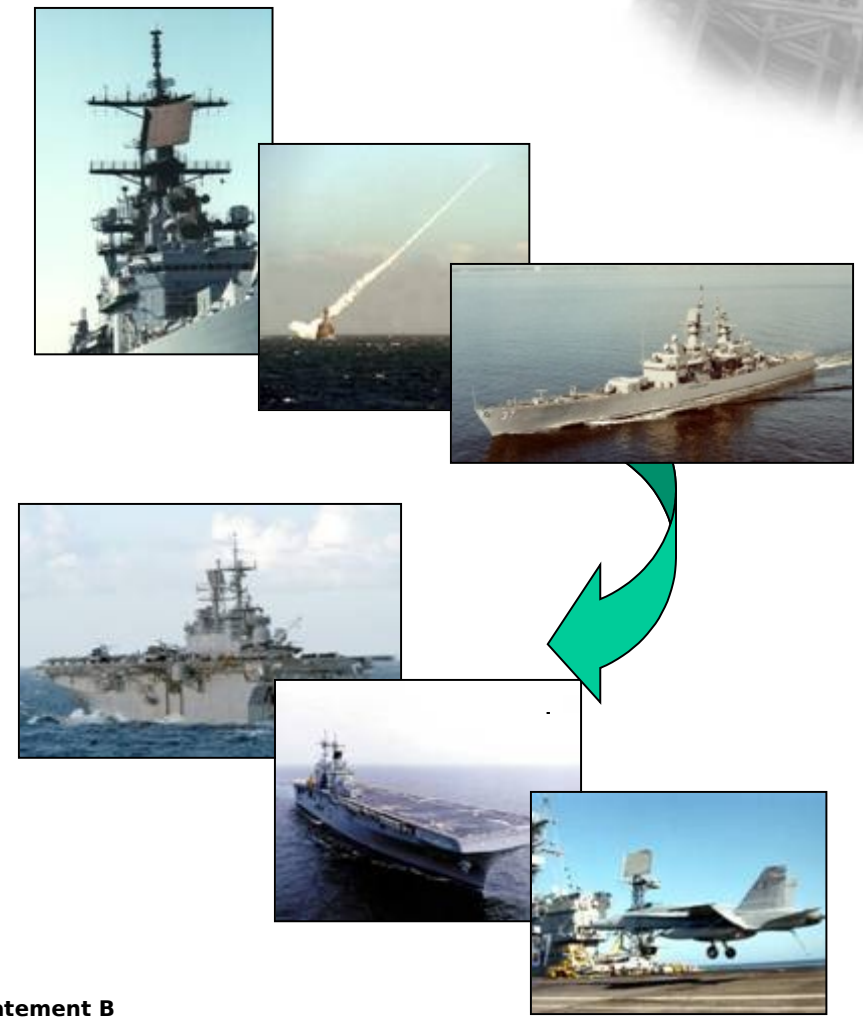
Technology Insertion into Legacy Systems

- The Legacy AN/SPS-48E Radar – 45 Units
  - Primary Function
    - 3D Air Surveillance
  - Part of New Threat Upgrade Combat Suite
    - Destroyers & Cruisers
  - In Service Date: 1984
  - Expanded role to all Carriers, including CVN77, LHDs, LHAs, LPD17 Class Ships
  - Projected Service Life
    - 2040 vs. planned 2005



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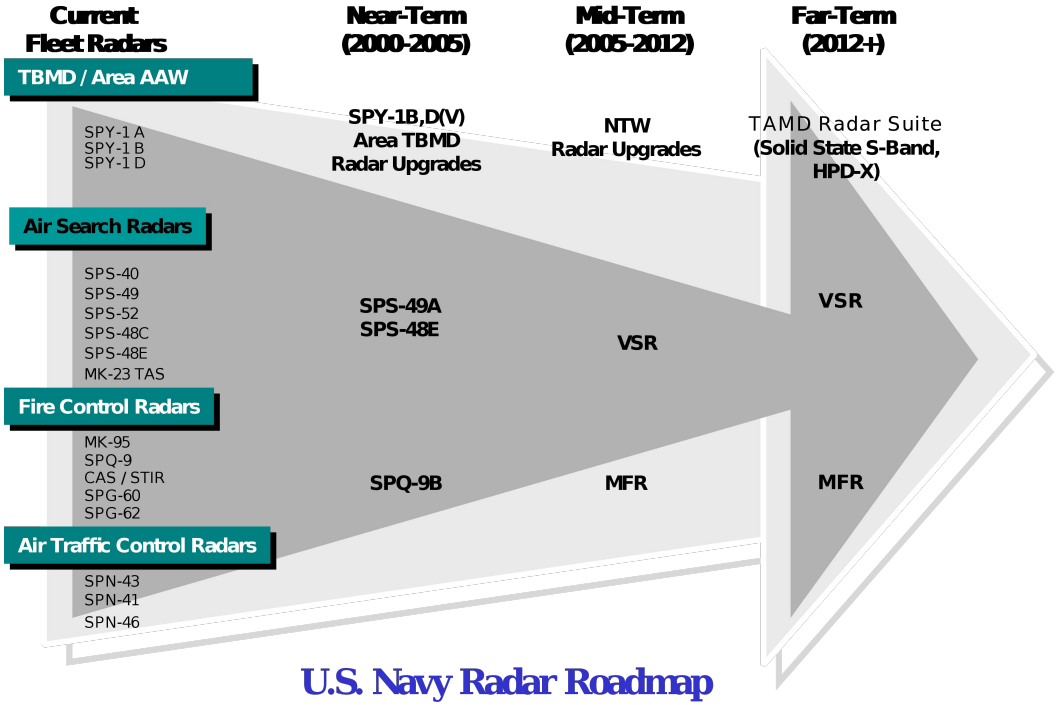
Technology Insertion into Legacy Systems

- **AN/SPS-48E's role on the Radar Roadmap**
  - **Legacy System used as a Gap Filler until other technologies are fielded**



U.S. Navy Radar Roadmap

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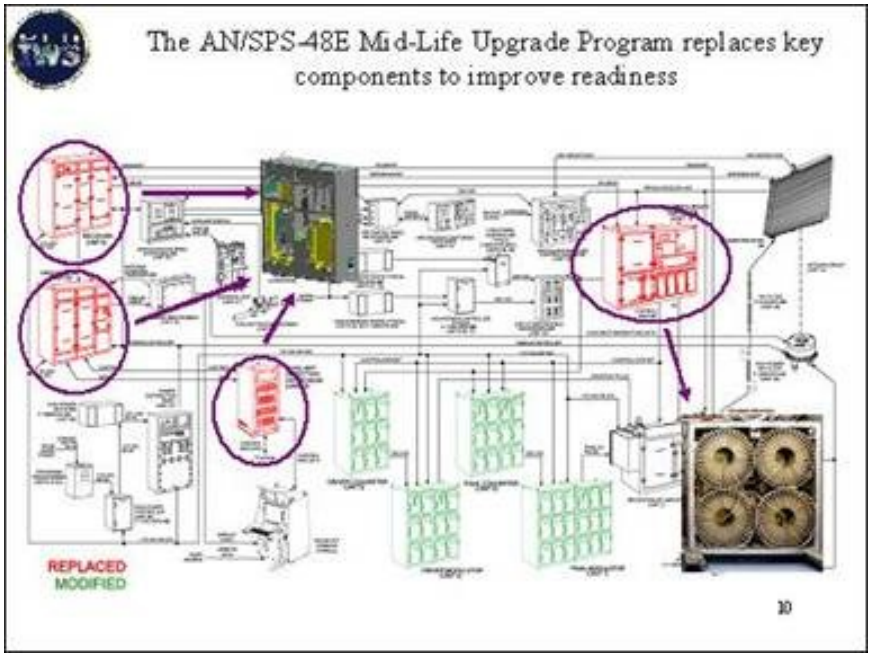
Technology Insertion into Legacy Systems

- **Desired Outcome for supportability, maintenance and performance**
  - **Improve RM&A**
    - **Reverse overall trend in A_0**
      - **0.77 in FY-99**
      - **0.70 (Recent 12 Months)**
  - **Take advantage of technology insertion/refresh**
    - **Modular Architecture of 48E Radar allows for timely modernization**
    - **Solid State for stability improvement**
    - **Reducing Footprint**
    - **Software Re-hosting**

Radar's Modular Design Enhances Technology Insertion



Replacement Units Marked in Red
Modified Units Marked in Green

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Technology Insertion into Legacy Systems

- **Technology Insertion Strategies**
  - **Capture & Hold Base**
    - **Refurbishment Program**
    - **Spares and Repairs**
    - **Engineering Development Model**
    - **Foreign Military Sales Programs**
    - **Performance Modifications**
  - **Diminished Industrial Capacity Survey**
    - **NSWC, Crane & Industry**
  - **Capitalize on Business Base with Diminished Capacity Focus**
    - **Technology fold over from all programs to reach desired outcomes**
  - **Develop Business Model**
  - **Have a 3rd Party Calculate ROI**

Forecast of Diminished Capacity Caused by Unable to Procure

Source Data: NSWC Crane

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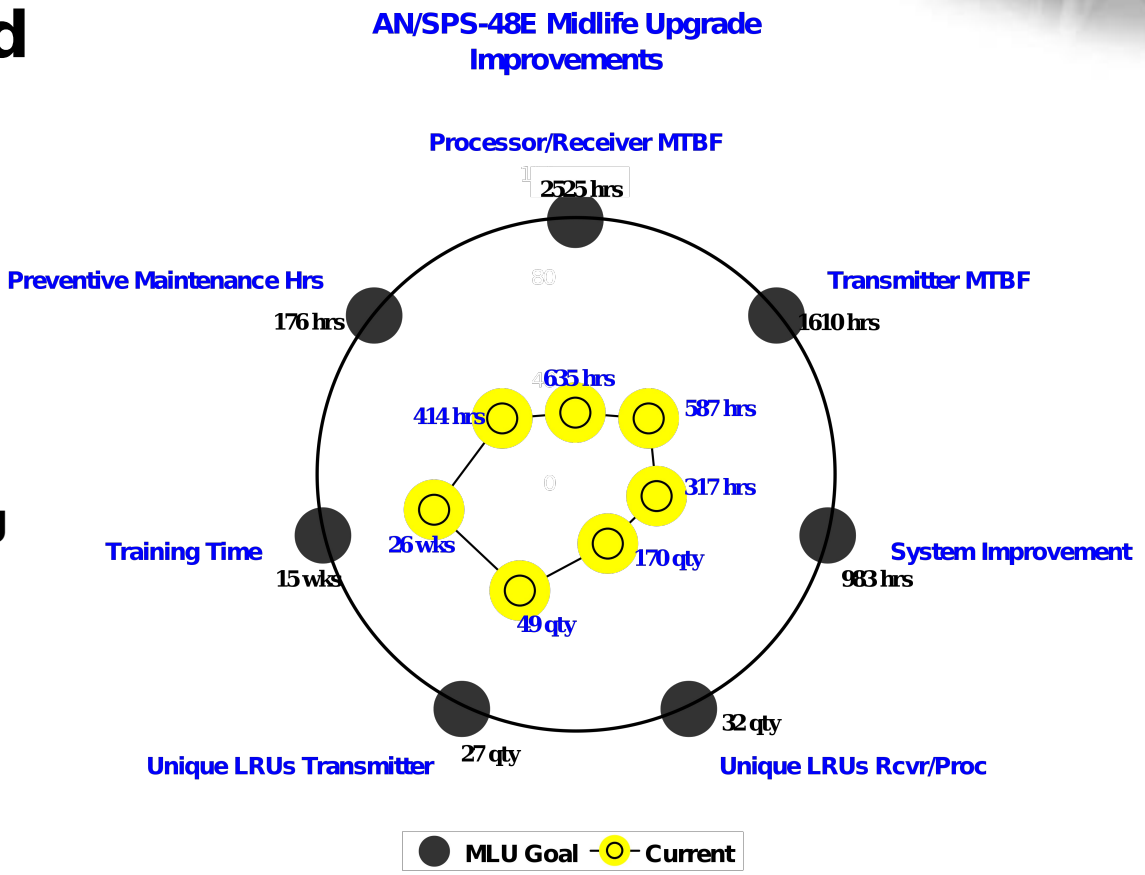
Technology Insertion into Legacy Systems

- **Measuring desired outcomes**
  - **Establish Goals**
    - **RM&A**
      - **Reduce LRUs**
      - **Improve MTBF**
      - **Improve MTTR**
      - **Reduce Training Time**
  - **Capture Value Added**
    - **Spider Diagram**



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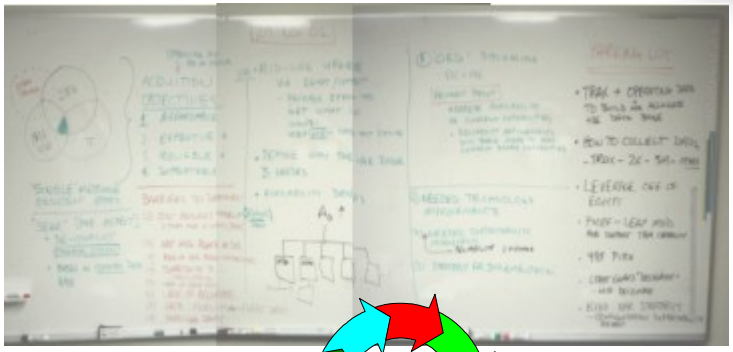
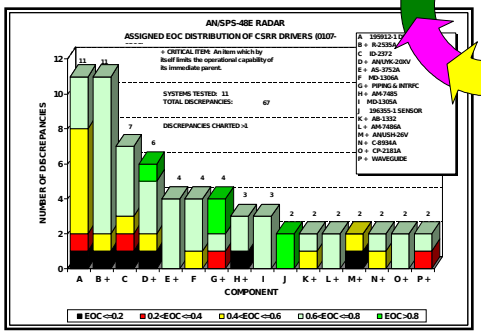
Technology Insertion into Legacy Systems

- **Engaging Technology Insertion Process**
  - **Start with a Core Group**
    - **Establish Desired Outcomes**
    - **Meet Periodically**
    - **Establish Technology Goals**
    - **Data Drive**
  - **Listen to User Community**
    - **TMI/TMA**
    - **Workshops**
  - **Listen to Sponsor Community**
    - **NSWC**
    - **NAVICP**
    - **NAVSEA**
    - **OPNAV**





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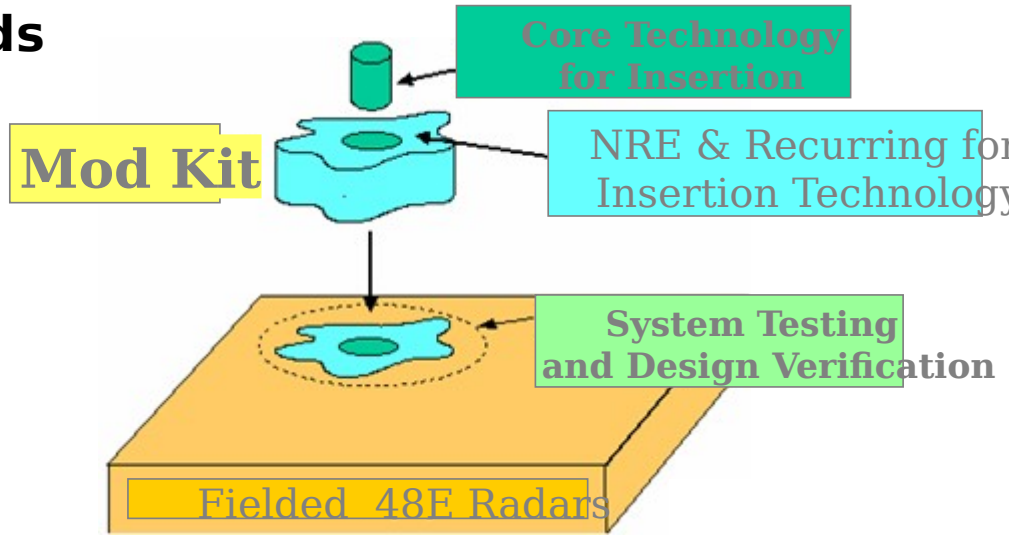
Technology Insertion into Legacy Systems

- **Review of Tactics Used for Technology Insertion**
  - **Open Discussion of Needs**
  - **Benchmark**
  - **Engage customers and end users**
  - **Inventory Technology**
  - **Focus on Value**
  - **Establish Metrics to Measure Value**
  - **Conduct Risk Assessment**


Core Technology for Insertion
Mod Kit
NRE & Recurring for Insertion Technology
System Testing and Design Verification
Fielded 48E Radars

Technology Insertion Concepts

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